Health of the Commonwealth: Nutritional Status of Massachusetts Residents

A Report of the Massachusetts Nutrition Board

Bureau of Family and Community Health

Massaschusetts Department of Public Health

March 2004

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March
2004

Acknowledgements

The authors of this report were Elizabeth Barden, PhD, Jan Kallio, MS, RD, LDN, and Joshua Nyambose, PhD, MALD, of the Bureau of Family and Community Health, Massachusetts Department of Public Health. This report reflects the active involvement and participation of the members of the Massachusetts Nutrition Board (see Appendix 1 for current membership), in particular the contributions by Maria Bettencourt, MPH, and Rena Prendergast, MTS, RD, LDN.

In addition, we appreciate the assistance and input of Mary Kelligrew Kassler, MBA, and Anne Pearson, MS, RD, of the Massachusetts WIC Nutrition Program; Stephanie Lambou, MPH, of the Bureau of Family and Community Health; and Susan Keyes, MPH, DrPH, and Lorelei Mucci, of the Bureau of Health Statistics, Research and Evaluation. We extend a very special thank you to the students from Tufts University who assisted with this report: Bernadette Binewald, Christine Gandofolo, and Seema Dixit. The suggestions of three anonymous reviewers are greatly appreciated.

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Executive Summary

The Massachusetts Nutrition Board (MNB) provides leadership on nutrition issues that affect the residents of the Commonwealth. This MNB report is intended to inform public policy. It presents available data describing the nutritional status of Massachusetts residents, and compares them to established federal health benchmarks. By so doing, the report highlights areas where public health nutrition programs have been effective and identifies gaps where nutrition programs, data collection mechanisms, and other resources may be needed. This report highlights selected data elements, collected between 1990 and 2001, related to nutrition and overweight, physical activity, and maternal and child health. Where possible, data are compared to Healthy People 2010 objectives.

Nutrition and Overweight

- Overweight and obesity are on the rise in Massachusetts adults. Since 1990, there has been a 27% decline in the prevalence of adults of normal weight status, and a 60% increase in the prevalence of adult obesity.
- Adults do not consume the recommended daily number of fruits and vegetables. Fewer than two-thirds of adults report consuming at least two servings of fruit per day, and less than one-third report consuming at least three vegetables a day. Adolescents are even less likely than adults to report consumption of at least two servings of fruit per day.
- Fewer than 36% of women reported sufficient daily calcium intake.
- Food insecurity and hunger exist in Massachusetts, but at a lower prevalence than nationally. The prevalence of food-secure households in Massachusetts was 92%.

Physical Activity and Fitness

- Adults and adolescents do not meet recommendations for regular vigorous physical activity, with only 17% of adults and 62% of adolescents, reporting regular engagement in vigorous physical activity.

Maternal, Infant, and Child Health

- The proportion of babies with low birthweight (LBW; birthweight less than 2,500 grams or 5 lbs 8 oz) has increased from 5.8% in 1990 to 7.2% in 2001.
- There are disparities in the incidence of LBW by race/ethnicity, with non-Hispanic Blacks having the highest incidence of LBW infants (11.2% in 2001, compared to 7.2% for all births in 2001).
- Folic acid intake in preconceptual women is below recommended levels, with 43% consuming an average of 400 µg daily.
- Breastfeeding at six months and one year are below national benchmarks, with 38% of low-to-moderate income mothers reporting breastfeeding for six months

and only 8.3% reporting breastfeeding at one year (data on breastfeeding duration for the general population are not available).

Limitations of the Data

- Nutritional status data are not available for Massachusetts residents who do not participate in specific state or federally funded programs, who do not participate in surveys, or who do not appear in annual vital registry data (such as the birth registry). The degree of nutritional risk of Massachusetts residents not served by such programs is unknown. Available data are limited to populations served by existing specific state or federal programs.
- Available data useful in characterizing the nutritional status of individuals receiving services from state and federal programs using national benchmark indicators (Healthy People 2010) are limited. Most programs are not funded to develop and maintain mechanisms to collect nutritional status data.
- There are no data available regarding the following indicators:
  - the consumption pattern for whole grains, saturated fat, total fat, or sodium for persons aged 2 years and older
  - the daily physical education of public and private school students, or the television viewing of adolescents
  - physical activity among children below ninth grade
  - adult muscular strength, endurance, and flexibility
  - access to physical activity and fitness programs by all school-aged and adult populations

Recommendations:

The Massachusetts Nutrition Board recognizes that there is increased interest and attention to nutrition and its impact on personal health. Current efforts to enhance the nutritional health status of residents receiving nutrition-related services do make a significant difference in their lives. In addition, the Board acknowledges it is imperative to balance needs with recognition that we are in a period of constrained resources.

The Board has identified the following areas of need to develop short-term goals and activities and a long-term plan to ensure, promote, and assess the nutritional status of the residents of the Commonwealth.

- Expand efforts to collect, analyze, and report basic nutrition status indices to better characterize the nutritional status of Massachusetts residents.
  - Basic nutrition status indices, specifically height and weight, should be collected and reported by all state-funded health systems to effectively evaluate against nationally established benchmarks.

- Any programs that screen for nutrition status indices should establish a mechanism to collect, analyze, and report data.
- Ensure that the development of any new surveillance system accounts for data collection in a manner compatible with existing systems, fills in existing data collections gaps, eradicates definitional differences that do not allow continuity from one system to the next, and standardizes data collection and assessment methodologies across all age groups.
- Advocate for various federal agencies to coordinate how their surveillance elements are defined and collected, so that existing systems can be used for evaluation compared to Healthy People 2010.

- Explore mechanisms to collect dietary intake data that are useful to compare against the Healthy People 2010 benchmarks, specifically consumption patterns for whole grains, saturated fat, total fat, and sodium for persons aged two years and older.

- Within established nutrition programs that serve young children and adolescents, prioritize activities to address the prevention and control of overweight and obesity.

- Monitor food security among programs that serve nutritionally at-risk populations and develop ways to assess food security in the general population.

Beyond the recommendations generated by this report, the Board recognizes that there must be on-going focus and collaborative efforts to effectively respond to the nutritional needs and interests of the residents of Massachusetts. As such, the Board recommends the development of short term goals and long term plans to address the following additional areas of need:

- Increase multi-agency coordination in program planning and implementation to coordinate and disseminate successful nutrition interventions, and enhance coordinated and comprehensive nutrition services;
- Develop a compendium of nutrition messages, and promote their delivery by nutrition programs and the medical community to ensure that all residents of the Commonwealth receive consistent messages;
- Improve the visibility of nutrition programs across the general population of Massachusetts residents - not just to those who participate in state and federally funded programs – to promote and respond to the increasing interest in nutritional health. Ensure that the Legislature and other policy-makers are kept informed about nutrition program efforts and successes; and
- Establish and maintain a working relationship between academic institutions and public health programs.

Introduction

The General Court of the Commonwealth of Massachusetts has recognized that nutrition is the cornerstone of good health and as such, is a public health responsibility. The Massachusetts Legislature established the Massachusetts Nutrition Board (MNB) under Chapter 833 of the Acts of 1974, with the mandate to establish standards for nutrition services provided to the citizens of the Commonwealth and to ensure effective delivery of these services.

The MNB provides leadership and advocacy on nutrition issues affecting Massachusetts residents. The MNB goals include:

- To improve access to food and nutrition programs
- To increase participation in state and federal food and nutrition programs through coordinated outreach
- To reduce causes of hunger in the state
- To support emergency feeding and other direct food distribution efforts
- To educate the public about the relationship of nutrition to the maintenance of good health and the prevention of disease
- To monitor the nutritional status of all residents of Massachusetts, particularly those at high risk

These goals establish the framework by which the Board defines guidelines for action in legislation and public policy. MNB members are leaders in the field of nutrition and health as well as influential members of their communities. This unique combination of expertise allows the members to act together as a key advisory board to the Commonwealth regarding food and nutrition issues (see Appendix 1 for MNB membership).

Given renewed public interest in the nutritional and health status of Massachusetts residents, the Board elected to update the 1977 report entitled, “The Status of Nutrition and Nutritional Services: A Report of the Massachusetts Nutrition Board.” That report provided the latest data available on the nutritional health of Massachusetts residents and an inventory of food and nutrition programs that served the residents of the Commonwealth at that time. The report contained vital statistics data regarding death rates from nutrition-related diseases as well as data from two large national nutritional surveys, the National Health and Nutrition Examination Survey (conducted in Massachusetts in 1971-1974) and the Ten State Nutrition Survey (conducted between September 1969 and June 1970).

This report is intended to inform decision-makers about the current nutritional status of Commonwealth residents, to highlight areas where nutrition programs and funding may be needed, and to identify gaps in data collection in order to better assess the nutritional status of the Massachusetts population. One goal of the current report is to provide benchmark data that can be easily updated and readily available for future editions.

In addition, this report identifies gaps and limitations in the current public health nutrition surveillance infrastructure. The current report presents nutritional status objectives in three major categories: Nutrition and Overweight, Physical Activity and Fitness, and Maternal, Infant, and Child Health. These categories are based on national guidelines published by the U.S. Department of Health and Human Services (DHHS) in 2000. This national agenda, called Healthy People 2010, outlined a federal disease prevention and health promotion agenda to be achieved by the year 2010 (DHHS, 2000a). Healthy People 2010 contains objectives in multiple health-related areas including nutritional status. These Healthy People 2010 objectives are used in this report as a framework that allows Massachusetts data to be linked back to the federal guidance for nutrition monitoring.

In this report, selected Healthy People 2010 objectives are presented in conjunction with the federally-determined target, the recommended state-level data source where available, and supplementary data when no recommended data source exists. Data used in this report are derived from a variety of sources that are fully described in the technical foreword. This report is not directly comparable to the 1977 report, as there are differences in both the types of data available and data collection methodologies.

Technical Foreword

This section describes the data sources that are utilized in the report, including any technical considerations or limitations. In addition, the contact for the agency that produces the original report is provided. This section also provides a brief overview of how the Healthy People 2010 national agenda is used for comparison to statewide data.

Behavioral Risk Factor Surveillance System (BRFSS)

BRFSS is a continuous, random-digit-dial telephone survey of non-institutionalized adults age 18 and older, and is conducted in all states as a joint collaboration between the national Centers for Disease Control and Prevention (CDC) and state departments of health. Massachusetts has conducted this survey annually since 1986. BRFSS includes questions on a wide variety of health issues, ranging from health-related behavior and access to medical care to opinions on health-related policy issues. Results are used to identify the need for health interventions, to monitor effectiveness of prevention and intervention programs, to develop health policy and legislation, and to measure progress toward attaining state and national health objectives.

Limitations of the BRFSS need to be considered when interpreting the data. First, persons who do not have a telephone or who otherwise do not participate due to factors such as unavailability, language barriers or lack of interest are not represented. Second, specific questions are subject to self-reporting biases. Finally, because the BRFSS surveys only a sample of Massachusetts adults, results will differ to some extent from another sample taken from the same population due to chance alone. In addition, not all questions are asked every year. Data presented in the present report are taken from various reports published by the Massachusetts Department of Public Health (MDPH) from 1990 to 2003.

Contact: Health Survey Program
Center for Health Information, Statistics, Research and Evaluation
Massachusetts Department of Public Health
(617) 988-3100
http://www.state.ma.us/dph/bhsre/cdsp/brfss/brfss.htm

Youth Risk Behavior Survey (YRBS)

YRBS is a national survey developed by CDC to monitor the prevalence of health risk behaviors among high school students. In Massachusetts, the Massachusetts Department of Education (DOE) administers the survey every two years to 9th through 12th graders at randomly selected public high schools throughout the state. Students anonymously and voluntarily answer questions on a variety of health behaviors including diet, physical activity, weight control, alcohol consumption, and tobacco use. Data are subject to self-reporting biases. Data presented in the present report are taken from reports published by DOE in 2000 and 2002.

Contact: Research Director for Health Programs
Massachusetts Department of Education
http://www.doe.mass.edu

Pregnancy Nutrition Surveillance System (PNSS)

PNSS is a national surveillance system implemented to identify and reduce pregnancy-related health risks. PNSS, which is coordinated through CDC, collects nutrition-related data regarding the medical and behavioral risk factors associated with poor pregnancy outcome. In Massachusetts, all data submitted to PNSS are derived from the clinical service records of the Massachusetts Special Supplemental Nutrition Program for Women, Infants, and Children (the Massachusetts WIC Program). The WIC Program provides supplemental nutritious foods and nutrition education and counseling to moderate-to low-income pregnant and postpartum women and children up to five years of age who are at nutritional risk. Data presented in the present report are taken from a report published by MDPH in 2002.

Contact: Massachusetts WIC Program
Massachusetts Department of Public Health
250 Washington St., 6th Floor
Boston, MA 02108

Pediatric Nutrition Surveillance System (PedNSS)

PedNSS is a national surveillance system implemented to monitor the growth and nutritional status of low-income children who participate in federally-funded maternal and child health and nutrition programs. PedNSS, coordinated through CDC, collects data regarding the growth, health, and nutritional status of low-income children from birth to 18 years of age. Nationally, approximately 84% of records are submitted from the clinical service records of the WIC Program, with the remainder submitted from other federally-funded maternal and child health programs (such as Early and Periodic Screening, Diagnosis and Treatment [EPSDT] and Head Start). All PedNSS data for Massachusetts are submitted from clinical service records of participants in the WIC Program; therefore, data are only available for low- to moderate-income children up to five years of age. Data presented in the present report are taken from a report published by MDPH in 2003.

Contact: Massachusetts WIC Program
Massachusetts Department of Public Health
250 Washington St., 6th Floor
Boston, MA 02108

Food Security Data

Food security data are reproduced from Sullivan and Choi (2002). These investigators used data collected through the Current Population Survey (CPS) Food Security Supplements from August 1998, April 1999, and September 2000. The Food Security Supplement is sponsored by the U.S. Department of Agriculture and has been included with the CPS once each year since 1995. All prevalence estimates for Massachusetts are based upon national data, which are based on calculations that incorporate household weights adjusted for supplement non-response, to derive overall estimates that represent the total national non-institutionalized population.

Contact: Food Security Institute
Center on Hunger and Poverty
Brandeis University
Waltham, MA 02454
http://www.centeronhunger.org

Massachusetts Birth Data

Certain maternal health statistics are reproduced from *Massachusetts Births 2001.* This report, published by MDPH, is based on data collected from Massachusetts birth certificates registered during 2001. The report includes additional trend data from previous years' reports.

Contact: Massachusetts Department of Public Health
Center for Health Information, Statistics, Research and Evaluation
2 Boylston Street
Boston, MA 02116
(617) 988-3100

To obtain more information on births in Massachusetts and other Department of Public Health data, register for the Department's free, Internet-based public health information service, MassCHIP, via the website at:

http://masschip.state.ma.us

or call 1-888-MASCHIP (MA only) or (617) 624-5541.

Comparison of Massachusetts Data to Healthy People 2010

Each section of the report is named according to a corresponding chapter in Healthy People 2010, and is prefaced with a list of all of the Healthy People 2010 domains and associated objectives defined by DHHS relative to that chapter. Objectives for which there is appropriate statewide data for comparison are presented next. For each of these objectives, DHHS definitions, recommended state-level comparative data sources, and target goals are indicated prior to presentation of the data. When the recommended comparative data source is not available, the situation is noted, and in some instances, data from alternative sources are presented.

For further information on Healthy People 2010, and to view the complete document, please visit: http://www.healthypeople.gov/

Part 1: Nutrition and Overweight

Diet and nutrition are essential factors in the promotion and maintenance of health and well-being. There is strong evidence that nutritional or dietary factors play a major role as determinants of preventable chronic diseases including coronary heart disease, some types of cancers, stroke, type 2 diabetes mellitus, gall bladder disease, and hypertension among adults (DHHS, 2000a). The recent rise in the incidence of chronic diseases has been attributed in large part to the alarming increase in the number of overweight and obese people in the United States (DHHS, 2000a). In children, the health risks associated with obesity include bone and joint disease, increased blood pressure, serum cholesterol, and insulin resistance, as well as increased risk of non-insulin dependent diabetes. In addition, there is the concern that obese children are more likely to become obese adults and experience more of the health risks associated with adult obesity (Zemel and Barden, 2001).

At all ages, overweight and obesity are part of a continuum of overnutrition indicating degrees of severity and health risk. The risks of cardiovascular disease and hypertension escalate continuously with increasing weight. Consequently, there is a strong relationship between the prevention of overweight and obesity and the prevention of other chronic diseases. Consumption of fruit and vegetables, the amount and type of fat in the diet, and the intake of salt are among the most important elements of diet for prevention of obesity, heart disease, and many cancers. Throughout the life span, maintaining a normal weight through a healthy diet and obtaining adequate physical activity are the most effective ways of preventing obesity and other chronic diseases (DHHS, 2000a).

Dietary factors also are associated with other diseases including osteoporosis, anemia, and neural tube defects (DHHS, 2000a). Nutrients including calcium, folate, and iron have been identified as essential for health by the Dietary Guidelines for Americans (USDA, 2000). Calcium is important for the prevention of osteoporosis among postmenopausal women and elderly persons, folate for the prevention of neural tube defects, and iron for the prevention and treatment of anemia, particularly among child-bearing women and children. Iron deficiency anemia is the most common known nutritional deficiency, particularly among young children and women of childbearing age. Among infants (0-12 months) and preschool children (1-5 years), iron deficiency anemia has been reported to be associated with developmental delays and behavioral disturbances such as decreased motor activity, social interaction difficulties, attention deficit, and increased susceptibility to infection (CDC, 1998). In women of child bearing age, iron deficiency anemia is associated with an increase in pre-term delivery and low birthweight (LBW) (CDC, 1998).

Despite the growing concerns about the increase in obesity and dietary excesses among Americans, there are certain segments of the population, particularly those who are socially isolated and poor, who experience undernutrition and food insecurity (limited access to nutritionally adequate and safe foods). National measures and surveys have been developed to evaluate food security and hunger and to assess disparities among different population groups (DHHS, 2000a).

Nutrition and Overweight

Healthy People 2010 Goal: Promote health and reduce chronic disease associated with diet and weight.

The Healthy People 2010 objectives related to nutrition and overweight (Healthy People 2010 Chapter 19) reflect the following domains: weight status and growth, food and nutrient consumption, iron deficiency and anemia, schools, worksites, and nutrition counseling, and food security.

The complete list of Healthy People 2010 objectives related to nutrition and overweight follows:

NOTE: The objectives for which Massachusetts data are subsequently presented are identified by an asterisk.

1. Weight Status and Growth

19-1: *Increase the proportion of adults who are at a healthy weight.

19-2: *Reduce the proportion of adults who are obese.

19-3: Reduce the proportion of children and adolescents who are overweight or obese.

19-3a: Children aged 6 to 11 years.

*19-3b: Adolescents aged 12 to 19 years.

19-3c: Children and adolescents aged 6 to 19 years.

19-4: *Reduce growth retardation among low-income children under age 5 years.

2. Food and Nutrient Consumption

19-5: *Increase the proportion of persons aged 2 years and older who consume at least two daily servings of fruit

19-6: *Increase the proportion of persons aged 2 years and older who consume at least three daily servings of vegetables, with at least one-third of them being dark green or orange vegetables

19-7: Increase the proportion of persons aged 2 years and older who consume at least six daily servings of grain products, with at least three being whole grains.

19-8: Increase the proportion of persons aged 2 years and older who consume less than 10 percent of calories from saturated fat.

19-9: Increase the proportion of persons aged 2 years and older who consume no more than 30 percent of calories from total fat.

19-10: Increase the proportion of persons aged 2 years and older who consume 2,400 mg or less of sodium daily.

19-11: *Increase the proportion of persons aged 2 years and older who meet dietary recommendations for calcium.

3. Iron Deficiency and Anemia

19-12: *Reduce iron deficiency among young children and females of childbearing age.

*19-12a: Children aged 1 to 2 years.

*19-12b: Children aged 3 to 4 years.

19-12c: Nonpregnant females aged 12 to 49 years.

19-13: Reduce anemia among low-income pregnant females in their third trimester[1].

19-14: *(Developmental[2]) Reduce iron deficiency among pregnant females.

4. Schools, Worksites, and Nutrition Counseling

19-15: (Developmental) Increase the proportion of children and adolescents aged 6 to 19 years whose intake of meals and snacks at school contributes to good overall dietary quality.

19-16: Increase the proportion of worksites that offer nutrition or weight management classes or counseling.

19-17: Increase the proportion of physician office visits made by patients with a diagnosis of cardiovascular disease, diabetes, or hyperlipidemia that include counseling or education related to diet and nutrition.

5. Food Security

19-18: *Increase food security among U.S. households and in so doing reduce hunger.

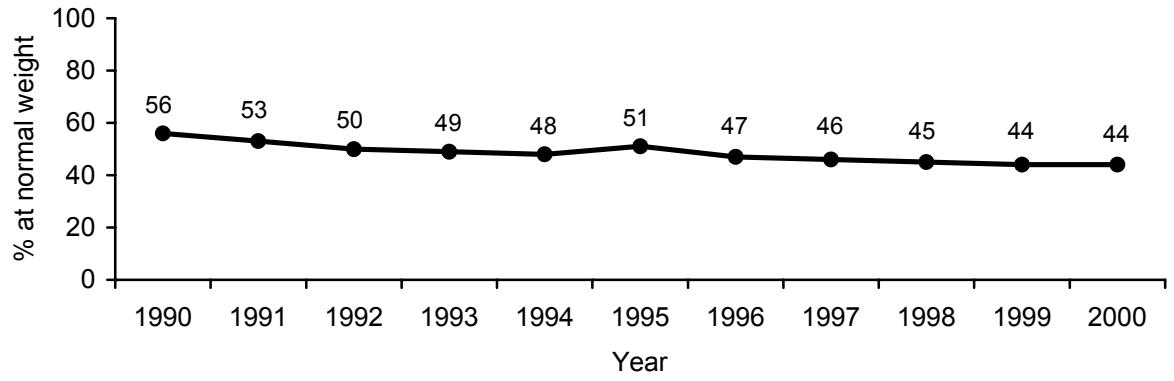
[1] DHHS (2000) has specified PNSS as the state comparison data source. However, state-level data are not available for hemoglobin (Hgb) or hematocrit (Hct) status specifically during the third trimester. Typically, Hgb or Hct data are recorded by the Massachusetts WIC Program at the pregnant woman's initial prenatal certification, which usually occurs prior to 20 weeks gestation. Therefore, data related to anemia during pregnancy are presented following Objective 19-14, which does not specify an explicit timeframe during pregnancy for measurement.

[2] "Developmental" refers to objectives which are currently without national baseline data. According to DHHS, these objectives are so important that they have been identified as priorities for data collection.

1. Weight Status and Growth

HP 2010 Objective 19-1	Increase the proportion of adults who are at a healthy weight[1].
Definition	Number of persons aged 20 years and older with a body mass index (BMI) equal to or greater than 18.5 and less than 25.0.
State Data Source	BRFSS
Target	At least 60%

Figure 1: Trend in percentage of Massachusetts adults who were of normal weight, 1990-2000



Source: Massachusetts BRFSS, 1990 - 2000

- In 2000, 44% of Massachusetts adults were of normal body weight based on Healthy People 2010 standards, compared to 56% in 1990.
- Since 1990, there has been a 27% decline in the proportion of adults of normal weight status.

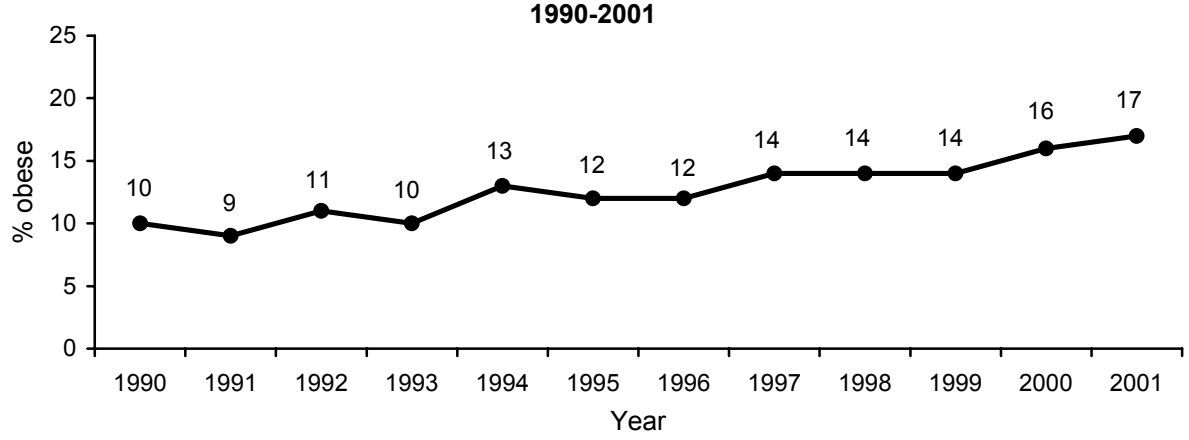
[1] Body Mass Index (BMI) is used to determine weight status categorization. BMI is calculated by dividing an individual's weight in kilograms by his or her height in meters squared (BMI = wt/ht^2).

Weight status categories based on BMI (NIH, 1998)

BMI Cutoffs	Weight Status
Less than 18.5	Underweight
18.5 – 24.9	Normal weight
25.0 – 29.9	Overweight
30.0 and over	Obese

HP 2010 Objective 19-2	Reduce the proportion of adults who are obese.
Definition	Number of persons aged 20 years and older with a BMI at or above 30.0[1].
State Data Source	BRFSS
Target	15% or less

Figure 2: Trend in percentage of Massachusetts adults who were obese, 1990-2001



Source: Massachusetts BRFSS, 1990 - 2001

- In 2001, the proportion of adults who were obese was 17%, compared to 10% in 1990.
- This difference represents a 70% increase in the prevalence of adult obesity since 1990.

[1] See previous page for a description of how weight status is assigned based on BMI.

HP 2010 Objective 19-3	Reduce the proportion of children and adolescents who are overweight or obese[1].
19-3a:	Children aged 6 to 11 years.
Definition	Number of children aged 6 to 11 years with a BMI at or above the age- and sex-specific 95th percentile relative to the CDC Growth Charts.
State Data Source	Not identified at this time
Target	5% or less
19-3b:	Adolescents aged 12 to 19 years.
Definition	Number of children aged 12 to 19 years with a BMI at or above the age- and sex-specific 95th percentile relative to the CDC Growth Charts.
State Data Source	Not identified at this time
Target	5% or less
19-3c:	Children and adolescents aged 6 to 19 years.
Definition	Number of children aged 6 to 19 years with a BMI at or above the age- and sex-specific 95th percentile relative to the CDC Growth Charts.
State Data Source	Not identified at this time
Target	5% or less

DHHS has not identified a state data source for comparison to national baseline data derived from the National Health and Examination Survey (NHANES; DHHS, 2000a). However, Massachusetts data regarding weight status among adolescents aged 12 to 19 years is available from the Massachusetts YRBS since 1999. Unlike NHANES, though, Massachusetts YRBS weight and height data, from which BMI is computed, is based on self-report instead of measured weight and height. Therefore, these data should be used with caution when comparing to measurement-based data sources such as NHANES.

Table 1: Percentage of Massachusetts adolescents aged 12 to 19 years at risk for overweight and already overweight in 1999

	At risk for overweight (85th percentile < BMI-for-age < 95th percentile)	Overweight[2] (BMI-for-age > 95th percentile)
1999	15%	7%
2001	15%	10%

Source: Massachusetts YRBS, 2000, 2002

[1] Note that this terminology is based on the DHHS Healthy People 2010 nomenclature; it is not consistent with CDC's recent recommendation that the term "obese" not be used in reference to a child's weight status. Instead, CDC recommends that those children whose BMI-for-age is at or above the 95th percentile be classified as "overweight," whereas those whose BMI-for-age falls between the 85th and 95th percentiles be classified as "at risk for overweight."

[2] This category corresponds with Objective 19-3b.

DHHS has not defined a Healthy People 2010 benchmark regarding overweight and obesity for children under age 6. However, Massachusetts does collect relevant data for children between the ages of 2 and 5 who participate in the WIC Program. Given the rapidly growing national epidemic of pediatric overweight, it is important to present data among the youngest age groups.

Table 2: Percentage of Massachusetts low- to moderate-income children aged 2 to 5 years at risk for overweight and already overweight, 2001-2002

	At risk for overweight (85^{th} percentile < weight for height < 95^{th} percentile), %	Overweight (weight for height > 95^{th} percentile), %
2001	16.6	16.4
2002	16.6	16.5

Source: Massachusetts PedNSS, 2001, 2002

Note: These data were collected only from low- to moderate-income children who are known to be at nutritional risk and may not be representative of all children in Massachusetts between the ages of 2 and 5.

- The proportion of children who were at risk for becoming overweight (16.6%) was the same for both 2001 and 2002. This proportion is 6.6 percentage points larger than the 10% expected in a normally distributed population.
- The proportion of children who were already overweight did not differ greatly in 2002 (16.5%) compared to 2001 (16.4%). The proportion of children in this group is more than three times greater than expected in a normally distributed population (5%).
-

HP 2010 Objective 19-4	Reduce growth retardation among low-income children under age 5 years.
Definition	Number of low-income children under age 5 years who are below the 5th percentile of height-for-age.
State Data Source	PedNSS
Target	5% or less

Table 3: Percentage of low- to moderate-income Massachusetts children aged 0 to 59 months below the 5th percentile of height-for-age

	< 5th percentile height-for-age
2001[1]	4.9%

Source: Massachusetts PedNSS, 2001

- The 2001 prevalence of low height-for-age in Massachusetts is lower (4.9%) than the 2000 national prevalence of 6.4% among low-income children less than 5 years of age.
- When data are restricted to children between 2 and 5 years of age, the prevalence of low height-for-age is even lower, at 3.8%.

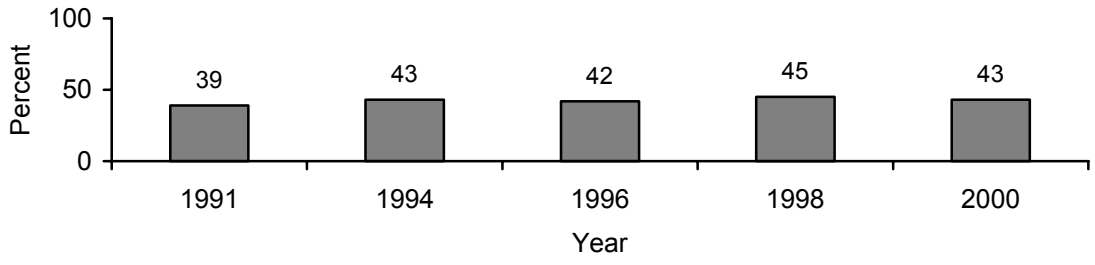
[1] Technical note: Data prior to 2001 are not presented because they were based on comparison to the 1977 NCHS/CDC growth charts, while data for 2001 are based on comparison to the revised 2000 CDC growth charts. Since the reference dataset is different, previous years' data are not comparable.

2. Food and Nutrient Consumption

HP 2010 Objective 19-5	Increase the proportion of persons aged 2 years and older who consume at least two daily servings of fruit.
Definition	Number of persons aged 2 years and older who report consuming two or more servings of fruit daily (based on a 2-day average)[1].
State Data Source	BRFSS, YRBS
Target	75% or more
HP 2010 Objective 19-6	Increase the proportion of persons aged 2 years and older who consume at least three daily servings of vegetables, with at least one-third of them being dark green or orange vegetables[2].
Definition	Number of persons who report consuming three or more servings of vegetables daily, of which at least one-third are dark green or orange vegetables (based on a 2-day average).
State Data Source	BRFSS, YRBS
Target	50% or more

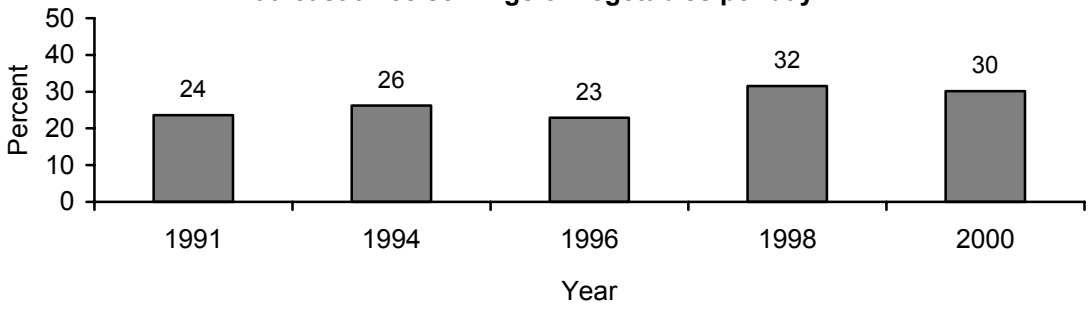
Adults

Figure 3: Percentage of adults reporting consumption of at least two servings of fruit per day



Source: Massachusetts BRFSS, 1991, 1994, 1996, 1998, 2000.

Figure 4: Proportion of Massachusetts adults reporting consumption of at least three servings of vegetables per day



Source: Massachusetts BRFSS, 1991, 1994, 1996, 1998, 2000.

[1] Includes 100 percent fruit juice and whole fruit.
[2] BRFSS and YRBS questions as written do not allow for consideration of the proportion of vegetables consumed that are dark green or orange. Therefore, the data does not exactly match the Healthy People 2010 indicator.

- In each of the five years of data presented (Figure 3), fewer than two-thirds of adults (aged 18 to 44) met the target of 75% of adults consuming at least two servings of fruit per day.

- Figure 4 represents the proportion of Massachusetts adults reporting consumption of at least three servings of vegetables per day.

- Although the proportion of Massachusetts adults who reported consuming at least three servings of vegetables per day increased 20%, from 24% in 1991 to 30% in 2000, it has been below the target of 50% or more for each of the 5 years for which data was collected.

Adolescents

Table 4: Percentage of Massachusetts high school students reporting consumption of at least five servings of fruit or vegetables per day

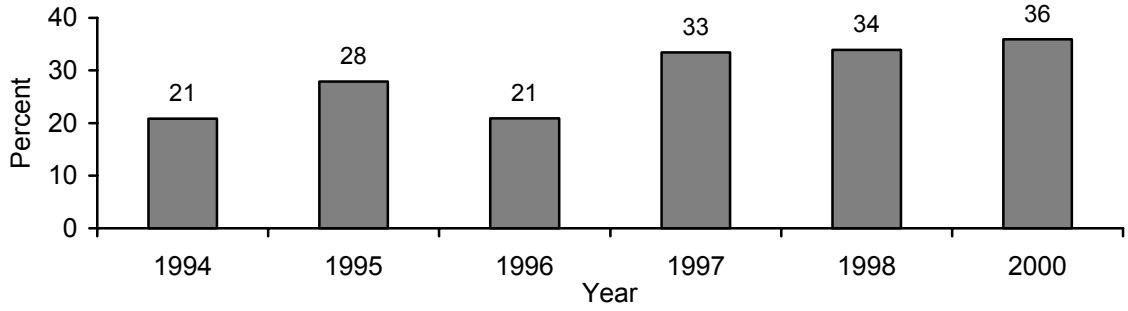
	≥ 5 servings of fruit or vegetables per day
1999	14%
2001	13%

Source: Massachusetts YRBS, 2000, 2002

- In the week before the survey was administered, adolescents consumed an average of 2.7 and 2.6 servings of fruits and/or vegetables per day in 1999 and 2001, respectively. It is important to note that the YRBS data includes servings of fruit, fruit juice, potatoes, green salad, and other cooked or raw vegetables. Fruit and vegetable intake data are not available separately for comparison to the Healthy People 2010 benchmarks. In addition, data is reported at the level of five or more servings of fruits and vegetables per day as recommended by national nutritional guidelines, which also differs from the Healthy People 2010 benchmark of two or more servings of fruit per day, and three or more servings of vegetables per day.

HP 2010 Objective 19-11	Increase the proportion of persons aged 2 years and older who meet dietary recommendations for calcium.
Definition	Number of persons aged 2 years and older who report calcium intake at or above approximated mean requirements.
State Data Source	Not identified
Target	75% or more

Figure 5: Percentage of Massachusetts women reporting sufficient calcium intake, 1994-2000



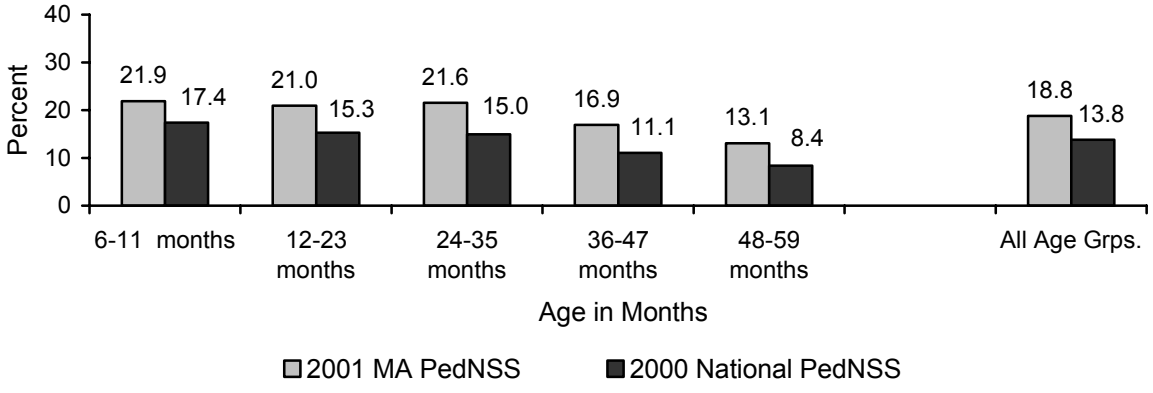
Source: Massachusetts BRFSS, 1994, 1995, 1996, 1997, 1998, 2000

- The Massachusetts BRFSS began including a question for women regarding calcium intake in 1994. There are no data collected on calcium intake in men.
- BRFSS defines sufficient calcium intake as 3 or more servings of dairy per day, daily intake of a calcium supplement, or at least 2 servings of dairy and a calcium supplement on most days. Note that this definition does not exactly match the Healthy People 2010 definition, which is based on intake at or above mean requirements.
- There has been an increase in the number of women reporting sufficient calcium intake, from 21% in 1994 to 36% in 2000.

3. Iron Deficiency and Anemia

HP 2010 Objective 19-12	Reduce iron deficiency among young children and females of childbearing age.
19-12a:	Children aged 1 to 2 years.
Definition	Number of children aged 1 to 2 years with abnormal results for two or more of the following tests: serum ferritin, free erythrocyte protoporphyrin, or transferrin saturation.
State Data Source	Not identified
Target	5% or less
19-12b:	Children aged 3 to 4 years.
Definition	Number of children aged 3 to 4 years with abnormal results for two or more of the following tests: serum ferritin, free erythrocyte protoporphyrin, or transferrin saturation.
State Data Source	Not identified
Target	1% or less
19-12c:	Nonpregnant females aged 12 to 49 years.
Definition	Number of females aged 12 to 49 years with abnormal results for two or more of the following tests: serum ferritin, free erythrocyte protoporphyrin, or transferrin saturation.
State Data Source	Not identified
Target	7% or less

Figure 6: Prevalence of anemia among low- to moderate-income children by age group, 2001



Source: Massachusetts PedNSS, 2001 (n = 47,174).

The assignment of anemia used for the preceding table is based on the application of the following age-specific cutoffs (either hemoglobin or hematocrit values may be used, depending upon which was collected):

		Hemoglobin, g/dL	Hematocrit, %
Age (years)	0.5 to <2	< 11.0	< 32.9
	2 to <5	< 11.1	< 33.0

Age and sex-specific cutoff values for anemia are based on the 5th percentile from the third National Health and Nutrition Examination Survey (NHANES III), which excluded persons who had a high likelihood of iron deficiency.

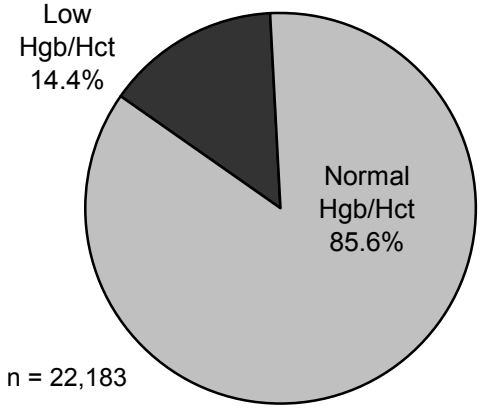
- Massachusetts does not collect data regarding serum ferritin, free erythrocyte protoporphyrin, or transferrin saturation from the general population as part of any existing surveillance system. Data are presented regarding the prevalence of anemia among low to moderate-income children who are represented in the PedNSS through their participation in the Massachusetts WIC Program. It is important to note that the PedNSS definition for a positive anemia screen, based on hemoglobin or hematocrit below the cutoffs described above, is different from the definition described above by DHHS for monitoring iron deficiency and anemia.
- In 2001, the prevalence of anemia among low- to moderate-income Massachusetts children less than 5 years of age (18.8%) was higher than among a similar national sample (13.8%).
- It is also important to note that children represented in PedNSS are considered to be at high nutritional risk; therefore, the prevalence of anemia in this subpopulation is expected to be higher than in the total population of Massachusetts children, for which there are no data for comparison.

19-12c: No Massachusetts data are available.

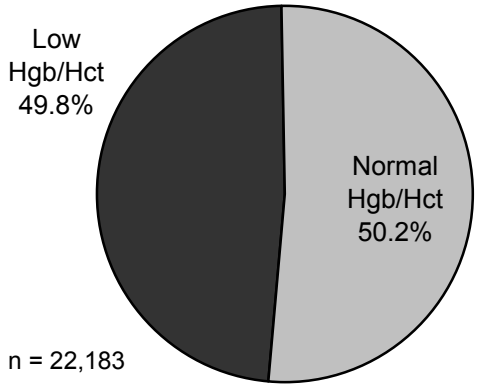
HP 2010 Objective 19-14	(Developmental) Reduce iron deficiency among pregnant females.
Definition	Not specified.
State Data Source	Not specified
Target	Not identified

DHHS (2000a) has not specified an operational definition for iron deficiency during pregnancy. However, state-level data are available from PNSS (and may not be generalizable). Assignment to low hemoglobin (Hgb) /hematocrit (Hct) status is defined based on cutoffs for Hgb and Hct, adjusted for trimester of pregnancy and smoking status (see Table 5). Hgb/Hct status is presented from both the prenatal assessment and the postpartum assessment at WIC.

Figure 7: Prenatal Hgb/Hct Status



Postpartum Hgb/Hct Status



Source: Massachusetts PNSS, 1999 (n = 22,183).

- The prevalence of low Hgb/Hct status is considerably greater in the postpartum period (49.8%) than prenatally (14.4%). This largely may be due to the timing of the acquisition of the blood samples. Prenatal blood samples usually are obtained very early in pregnancy, and postpartum samples are most often collected immediately following delivery.

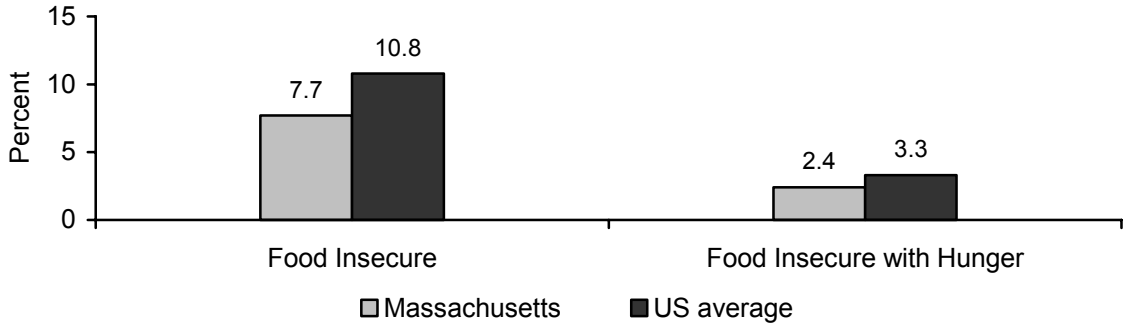
Cut-off values for anemia for pregnant women (CDC, 1998)

		Quantity Smoked in Cigarettes Per Day (CPD)			
		Nonsmokers	**10 - 19 CPD**	**20 – 39 CPD**	**40+ CPD**
Hemoglobin (g/dl)	First Trimester	11.0	11.3	11.5	11.7
	Second Trimester	10.5	10.8	11.0	11.2
	Third Trimester	11.0	11.3	11.5	11.7
Hematocrit (%)	First Trimester	33.0	34.0	34.5	35.0
	Second Trimester	32.0	33.0	33.5	34.0
	Third Trimester	33.0	34.0	34.5	35.0

5. Food Security

HP 2010 Objective 19-18	Increase food security[1] among U.S. households and in so doing reduce hunger.
Definition	Number of U.S. households that did not report experiencing food insecurity over a 12-month period.
State Data Source	Food Security Supplement to the Current Population Survey (CPS)
Target	94% or greater

Figure 8: Estimated prevalence of food insecurity and food insecurity with hunger, Massachusetts compared with US average, 1998-2000



Source: Sullivan and Choi, 2002[2]

- Massachusetts has not yet met the Healthy People 2010 goal of food security among 94% of households. However, the prevalence of food-secure households in Massachusetts was 92.3%, compared to 89.2% nationally.
- This translates into an estimated 180,000 households across Massachusetts reporting limited or uncertain access to sufficient food due to inadequate resources. Of these, an estimated 55,000 households also reported hunger (Sullivan and Choi, 2002).

[1] **Food Security:** Access by all people at all times to enough food for an active, healthy life. Food security includes at a minimum: (1) the ready availability of nutritionally adequate and safe foods, and (2) an assured ability to acquire acceptable foods in socially acceptable ways.

Food Insecurity: Limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways.

Hunger: The uneasy or painful sensation caused by a lack of food. The recurrent and involuntary lack of access to food.

Source: Life Sciences Research Office (Anderson, 1990).

[2] Data are not comparable to state-level estimates released in 1999 by USDA (Nord et al., 1999). Prior to 1998, data were adjusted to account for differences in screening questions during the three years of data collection from which averages were based. Since 1998, the same screening questions were utilized and adjustments are no longer necessary.

Part 2: Physical Activity and Fitness

Lack of physical activity is one of the leading preventable risk factors for the worldwide growing burden of non-communicable diseases in both developed and developing countries (CDC, 1996). In adults, regular physical activity substantially reduces the risk of dying of coronary heart disease, the nation's leading cause of death, and decreases the risk for colon cancer, diabetes and high blood pressure. It also helps to control weight, contributes to healthy bones, muscles, and joints, reduces falls among the elderly, helps relieve the pain of arthritis, and reduces stress, anxiety, and depression. Physical activity also is associated with fewer hospitalizations, physician visits, and medications (CDC, 2002). In addition, regular physical activity may improve mood and enhance ability to perform daily tasks throughout the life span (CDC, 1996). Moreover, physical activity need not be strenuous to be beneficial. A total of one hour a day on most days of the week of moderate intensity activity, such as brisk walking, is needed to maintain a healthy body weight for people with sedentary occupations (CDC, 2002). Among children and adolescents, regular exercise is necessary to achieve normal growth and development of body compartments, particularly the growth of bones and muscle tissues.

There has been a dramatic increase in the number of children who are obese and overweight in the United States in the past two decades, in part due to lack of physical activity (Dietz and Gortmaker, 2001). As in adults, obesity in children and adolescents is a major risk factor for chronic diseases including diabetes, hypertension, and high cholesterol. Adolescents who are overweight are more likely to be overweight in adulthood and suffer from an increased morbidity and early mortality (Dietz and Gortmaker, 2001). Children and adolescents who lead sedentary lifestyles, such as watching television, and who do not engage in regular physical activity, are more likely to be overweight or obese (Dietz and Gortmaker, 2001).

However, no data have been able to demonstrate a causal relationship between playing video and computer games and obesity, although video and computer games might be expected to be associated with obesity because, as with television watching, they are sedentary behaviors (Dietz and Gortmaker, 2001). Regular physical activity throughout the life cycle and reduction in the sedentary behaviors may be the key to preventing and controlling obesity in both children and adults.

Physical Activity and Fitness

Healthy People 2010 Goal: Improve health, fitness, and quality of life through daily physical activity.

The Healthy People 2010 objectives related to physical activity reflect the following domains: physical activity in adults, muscular strength/endurance and flexibility, physical activity in children and adolescents, and access. Each domain contains specific, measurable objectives to evaluate progress towards meeting a desired target.

The complete list of Healthy People 2010 objectives related to physical activity and fitness follows:

NOTE: The objectives for which Massachusetts data are subsequently presented are identified by asterisk.

1. Physical Activity in Adults

22-1: *Reduce the proportion of adults who engage in no leisure-time physical activity.

22-2: *Increase the proportion of adults who engage regularly, preferably daily, in moderate physical activity for at least 30 minutes per day.

22-3: *Increase the proportion of adults who engage in vigorous physical activity that promotes the development and maintenance of cardiorespiratory fitness 3 or more days per week for 20 or more minutes per occasion.

2. Muscular Strength/Endurance and Flexibility

22-4: Increase the proportion of adults who perform physical activities that enhance and maintain muscular strength and endurance.

22-5: Increase the proportion of adults who perform physical activities that enhance and maintain flexibility.

3. Physical Activity in Children and Adolescents

22-6: *Increase the proportion of adolescents who engage in moderate physical activity for at least 30 minutes on 5 or more of the previous 7 days.

22-7: *Increase the proportion of adolescents who engage in vigorous physical activity that promotes cardiorespiratory fitness 3 or more days per week for 20 or more minutes per occasion.

22-8: Increase the proportion of the Nation's public and private schools that require daily physical education for all students.

22-9: Increase the proportion of adolescents who participate in daily school physical education.

22-10: Increase the proportion of adolescents who spend at least 50 percent of school physical education class time being physically active.

22-11: Increase the proportion of adolescents who view television 2 or fewer hours on a school day.

4. Access

22-12: (Developmental) Increase the proportion of the Nation's public and private schools that provide access to their physical activity spaces and facilities for all persons outside of normal school hours (that is, before and after the school day, on weekends, and during summer and other vacations).

22-13: Increase the proportion of worksites offering employer-sponsored physical activity and fitness programs.

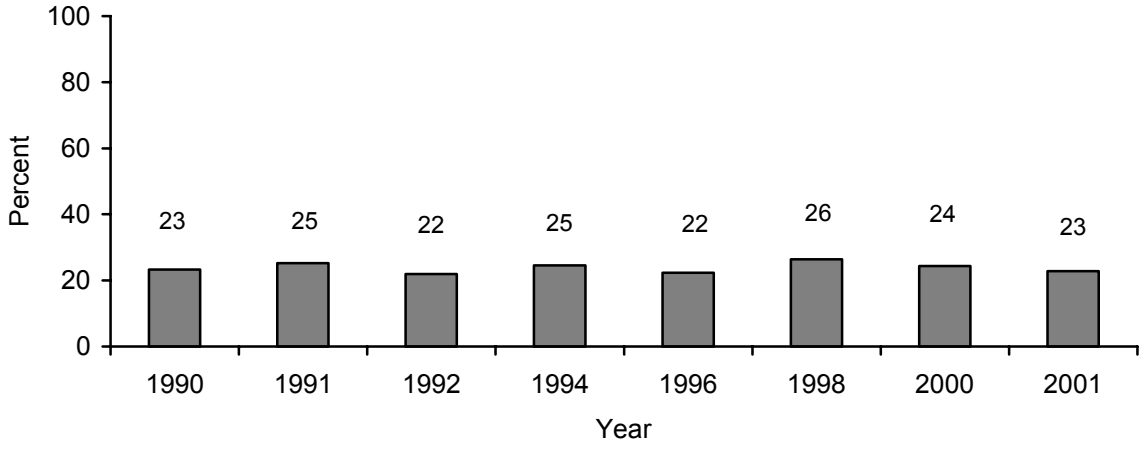
22-14: Increase the proportion of trips made by walking.

22-15: Increase the proportion of trips made by bicycling.

1. Physical Activity In Adults

HP 2010 Objective 22-1	Reduce the proportion of adults who engage in no leisure-time physical activity.
Definition	Number of adults aged 18 years and older who report that they never or are unable to do light or moderate physical activity for at least 20 minutes (at least 10 minutes after 1997) and that they never or are unable to do vigorous physical activity for at least 20 minutes (at least 10 minutes after 1997).
State Data Source	BRFSS
Target	20% or less

Figure 9: Percentage of Massachusetts adults reporting they are not participating in any physical activity, 1990-2001

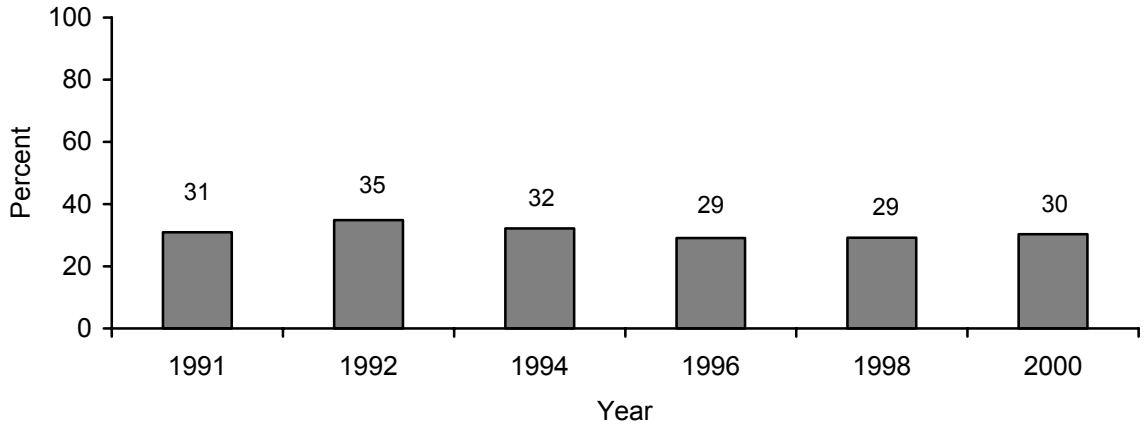


Source: Massachusetts BRFSS, 1990, 1991, 1992, 1994, 1996, 1998, 2000, 2001. Please note that the unit of scale on the x-axis is not continuous.

- For each of the eight years for which there is data, the proportion of Massachusetts adults who did not participate in physical activity was greater than the target of 20% or less.
- On average, for the past decade, nearly one-quarter of adults report never engaging in any physical activity.

HP 2010 Objective 22-2	Increase the proportion of adults who engage regularly, preferably daily, in moderate physical activity for at least 30 minutes per day.
Definition	Number of adults aged 18 years and older who report light or moderate physical activity for at least 30 minutes five or more times per week.
State Data Source	BRFSS
Target	30% or more

Figure 10: Percentage of Massachusetts adults who report they are engaged in regular physical activity, 1991-2000

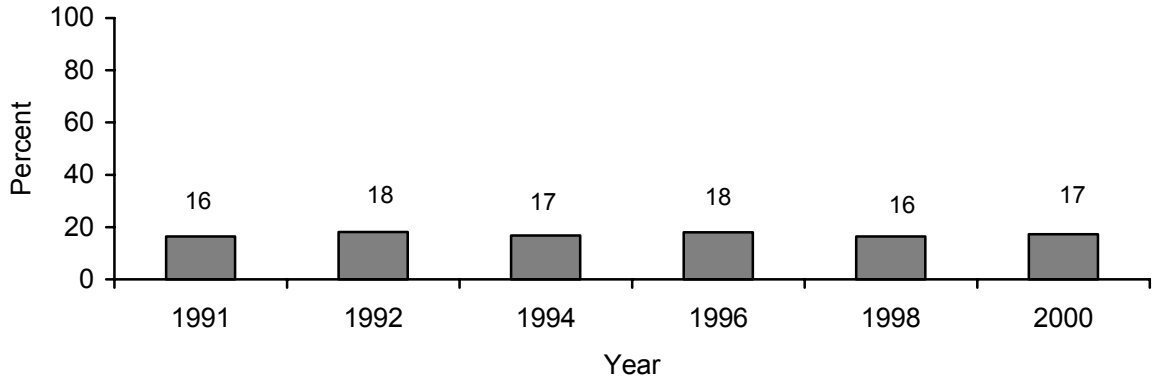


Source: Massachusetts BRFSS, 1991, 1992, 1994, 1996, 1998, 2000. Please note that the unit of scale on the x-axis is not continuous.

- In 2000 the proportion of Massachusetts adults who reported that they were engaged in regular physical activity was 30%.
- The proportion of Massachusetts adults who reported that they were engaged in regular physical activity met the target of 30% or more in 1991, 1992, 1994, and 2000. However, it was slightly below target in 1996 and 1998.

HP 2010 Objective 22-3	Increase the proportion of adults who engage in vigorous physical activity that promotes the development and maintenance of cardiorespiratory fitness 3 or more days per week for 20 or more minutes per occasion.
Definition	Number of adults aged 18 years and older who report participating in vigorous physical activity for at least 20 minutes 3 or more times per week.
State Data Source	BRFSS
Target	30% or more

Figure 11: Percentage of Massachusetts adults who report they are engaged in regular vigorous physical activity, 1991-2000



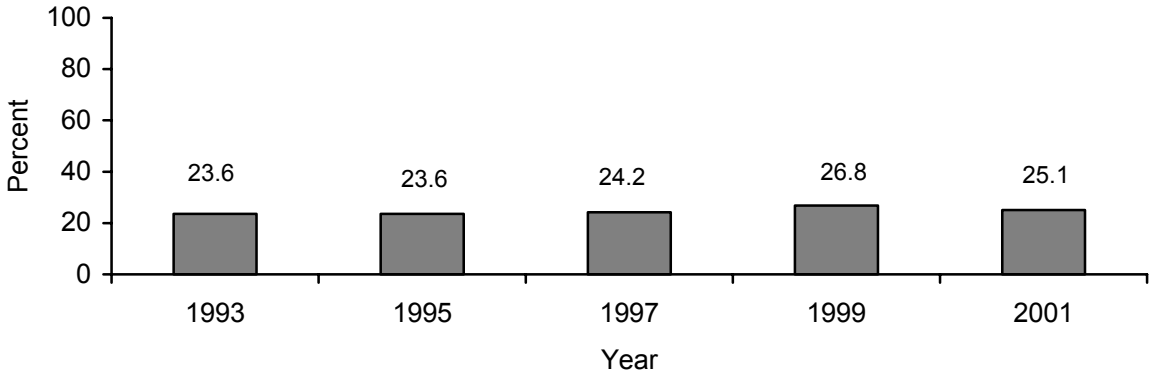
Source: Massachusetts BRFSS, 1991, 1992, 1994, 1996, 1998, 2000.

- In 2000, 17% of Massachusetts adults reported engaging in regular vigorous physical activity.
- In each of the 6 years for which data are reported, the proportion of Massachusetts adults who engaged in regular vigorous physical activity was about half of the Healthy People 2010 target of 30% or more.

3. Physical Activity in Children and Adolescents

HP 2010 Objective 22-6	Increase the proportion of adolescents who engage in moderate physical activity for at least 30 minutes on 5 or more of the previous 7 days.
Definition	Number of students in grades 9 through 12 who report participating for at least 30 minutes in physical activity that did not make them sweat or breathe hard on 5 or more of the 7 days preceding the survey.
State Data Source	YRBS
Target	35% or more

Figure 12: Percentage of Massachusetts high school students who reported they engaged in regular moderate physical activity, 1993-2001

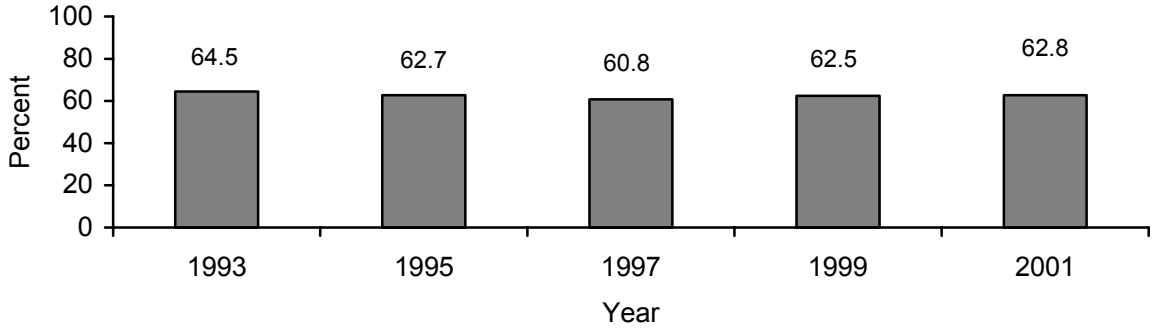


Source: Massachusetts YRBS, 2000, 2002.

- The proportion of Massachusetts high school students who reported engaging in moderate physical activity increased slightly from 23.6% in 1993 to 25.1% in 2001.
- The proportion of Massachusetts high school students who reported participating in regular physical activity was lower than the Healthy People 2010 target of 35% or more.

HP 2010 Objective 22-7	Increase the proportion of adolescents who engage in vigorous physical activity that promotes cardiorespiratory fitness 3 or more days per week for 20 or more minutes per occasion.
Definition	Number of students in grades 9 through 12 who report exercising or participating for at least 20 minutes in physical activity that made them sweat and breathe hard on 3 or more of the 7 days preceding the survey.
State Data Source	YRBS
Target	85% or more

Figure 13: Percentage of Massachusetts high school students who reported they were engaged in vigorous physical activity, 1993-2001



Source: Massachusetts YRBS, 2000, 2002.

- The proportion of Massachusetts high school students who reported engaging in vigorous physical activity was 62.8% in 2001.
- For each of the four years for which data are available, the proportion of students who reported participating in vigorous physical activity did not meet the target of 85% or more.

Part 3: Maternal, Infant, and Child Health

The health of mothers, infants and children is important not only because it reflects the current health status of the US population, but it also predicts the health of the next generation (DHHS, 2000a). Short gestation and low birthweight (LBW) are among the leading causes of neonatal death, accounting for 20 percent of neonatal deaths (DHHS, 2000a). LBW is defined as infants with birthweight less than 2500 grams, and includes both very low birthweight infants (VLBW; those weighing less than 1500 grams) and moderately low birthweight infants (those weighing between 1500 and 2500 grams). Maternal factors associated with LBW include maternal LBW, prior LBW birth history, low pre-pregnancy weight, cigarette smoking, multiple births, and insufficient pregnancy weight gain (DHHS, 2000a). Pre-pregnancy weight status is a major factor affecting infant birthweight. Women's weight status is assigned based on body mass index (weight in kilograms divided by height in meters squared). Women who are underweight prior to pregnancy have a higher recommended weight gain range than normal weight women, while overweight and obese women are advised to gain less weight (IOM, 1990). Inadequate weight gain during pregnancy increases the risk of delivering a LBW infant.

Many of the risk factors mentioned can be mitigated or prevented with good preconceptual and prenatal care. Preconception screening and counseling offer an opportunity to identify and mitigate maternal risk factors before pregnancy begins. Early prenatal care is important for the identification of women who are at high risk, and helps to alleviate modifiable risk factors (DHHS, 2000a). Interventions to improve maternal health and poor birth outcomes during pregnancy include the use of timely and high quality prenatal care, daily folic acid consumption to reduce the rate of neural tube defects, and participation in smoking cessation programs.

Breastfeeding is regarded as one of the most important contributors to infant health because human breast milk presents the most complete form of nutrition for infants (DHHS, 2000b). The American Academy of Pediatrics recommends that infants be exclusively breastfed for approximately the first 6 months after birth, and that breastfeeding continue until at least 12 months of age (Work Group on Breastfeeding, 1997). Breastfeeding has been shown to reduce rates of gastrointestinal, respiratory, and ear infections in infants, to influence infants' resistance to disease, to potentially accelerate their neural and cognitive development, and to protect against long-term chronic conditions and diseases including obesity and insulin-dependent diabetes mellitus. In addition, breastfeeding improves long-term maternal health by reducing postpartum bleeding, accelerating uterine involution, and promoting an earlier return to prepregnant weight. Breastfeeding also may offer protection against osteoporosis, and may reduce the risk of ovarian cancer and premenopausal breast cancer (Kramer and Kakuma, 2002; DHHS, 2000b; Work Group on Breastfeeding, 1997). Significant social and economic benefits of breastfeeding also have been observed, including reduced health care costs, reduced employee absenteeism attributable to infant illness, and substantial cost savings to the family compared with the purchase of infant formula.

Maternal, Infant, and Child Health

Healthy People 2010 Goal: Improve the health and well-being of women, infants, children, and families.

The Healthy People 2010 objectives related to maternal and child health reflect the following domains: fetal, infant, child, and adolescent deaths; maternal deaths and illnesses; prenatal care, obstetrical care; risk factors; developmental disabilities and neural tube defects; prenatal substance exposure; and breastfeeding, newborn screening, and service systems. Each domain contains specific, measurable objectives to evaluate progress towards meeting a desired target.

The complete list of Healthy People 2010 objectives related to maternal, infant, and child health follows:

NOTE: The objectives for which Massachusetts data are subsequently presented are identified by asterisk.

1. Fetal, Infant, Child, and Adolescent Deaths

16-1: Reduce fetal and infant deaths.
- 16-1a: At 20 or more weeks gestation
- 16-1b: Perinatal deaths
- 16-1c: Infant deaths
- 16-1d: Neonatal deaths
- 16-1e: Postneonatal deaths
- 16-1f: All birth defects
- 16-1g: Congenital heart defects
- 16-1h: SIDS deaths

16-2: Reduce the rate of child death.
- 16-2a: Children aged 1 to 4 years
- 16-2b: Children aged 5 to 9 years

16-3: Reduce deaths of adolescents and young adults.
- 16-3a: Adolescents aged 10 to 14 years
- 16-3b: Adolescents aged 15 to 19 years
- 16-3c: Adolescents aged 20 to 24 years

2. Maternal Deaths and Illnesses

16-4: Reduce maternal deaths.

16-5: Reduce maternal illness and complications due to pregnancy.
- 16-5a: At 20 or more weeks gestation
- 16-5b: Perinatal deaths
- 16-5c: Infant deaths

3. Prenatal Care

16-6: Increase proportion of pregnant women who receive early and adequate prenatal care.
- 16-6a: Care beginning in the first trimester of pregnancy
- 16-6b: Early and adequate prenatal care

16-7: (Developmental) Increase proportion of pregnant women who attend a series of prepared childbirth classes.

4. Obstetrical Care

16-8: Increase proportion of very low birthweight (VLBW) infants born at level III hospitals or subspecialty perinatal centers.

16-9: Reduce cesarean births.

16-9a: Women giving birth for the first time

16-9b: Prior cesarean birth

5. Risk Factors

16-10: *Reduce low birthweight (LBW) and very low birthweight (VLBW)

*16-10a: Low birthweight (LBW)

*16-10b: Very low birthweight (VLBW)

16-11: Reduce preterm births.

16-11a: Total preterm births

16-11b: Live births at 32 to 36 weeks of gestation

16-11c: Live births at less than 32 weeks of gestation

16-12: *(Developmental) Increase the proportion of mothers who achieve a recommended weight gain during their pregnancies.

16-13: Increase the percentage of healthy full-term infants who are put down to sleep on their backs.

6. Developmental Disabilities and Neural Tube Defects

16-14: Reduce the occurrence of developmental disabilities.

16-14a: Mental retardation

16-14b: Cerebral palsy

16-14c: Autism spectrum disorder

16-14d: Epilepsy

16-15: Reduce the occurrence of spina bifida and other neural tube defects (NTDs).

16-16: *Increase the proportion of pregnancies begun with an optimum folic acid level.

*16-16a: Consumption of at least 400 µg of folic acid each day from fortified foods or dietary supplements by nonpregnant women aged 15 to 44 years.

16-16b: Median red blood cell (RBC) folate level among nonpregnant women aged 15 to 44 years.

7. Prenatal Substance Exposure

16-17: Increase abstinence from alcohol, cigarettes, and illicit drugs among pregnant women.

16-17a: Alcohol

16-17b: Binge drinking

16-17c: Cigarette smoking

16-17d: Illicit drugs

16-18: (Developmental) Reduce the occurrence of fetal alcohol syndrome (FAS).

8. Breastfeeding, Newborn Screening, and Service Systems

16-19: *Increase the proportion of mothers who breastfeed their babies.

*16-19a: In early postpartum period.

*16-19b: At 6 months.

*16-19c: At 1 year.

16-20: (Developmental) Ensure appropriate newborn bloodspot screening, followup testing, and referral to services.

16-20a: Ensure that all newborns are screened at birth for conditions mandated by their State sponsored newborn screening programs, for example phenylketonuria and hemoglobinopathies.

16-20b: Ensure that followup diagnostic testing for screening positives is performed within an appropriate time period.

16-20c: Ensure that infants with diagnosed disorders are enrolled in appropriate service interventions within an appropriate time period.

16-21: (Developmental) Reduce hospitalization for life-threatening sepsis among children aged 4 years and under with sickling hemoglobinopathies.

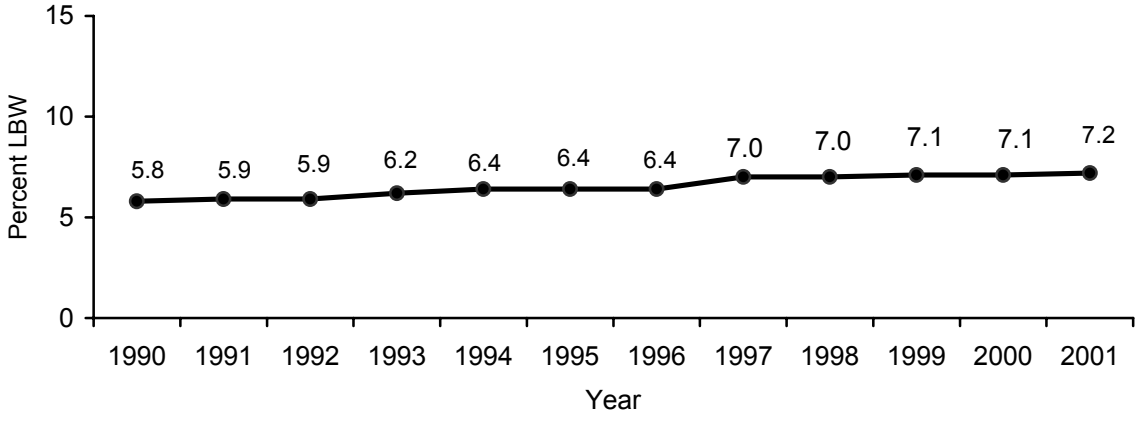
16-22: (Developmental) Increase the proportion of children with special health care needs who have access to a medical home.

16-23: Increase the proportion of Territories and States that have service systems for children with special health care needs.

5. Risk Factors

HP 2010 Objective 16-10	Reduce low birthweight (LBW) and very low birthweight (VLBW).
16-10a	Low birthweight (LBW).
Definition	Number of live births with weight of less than 2,500 grams (5 lbs 8 oz).
State Data Source	Not identified
Target	5.0% or less
16-10b	Very low birthweight (VLBW).
Definition	Number of live births with weight of less than 1,500 grams (3 lbs 4 oz).
State Data Source	Not identified
Target	0.9% or less

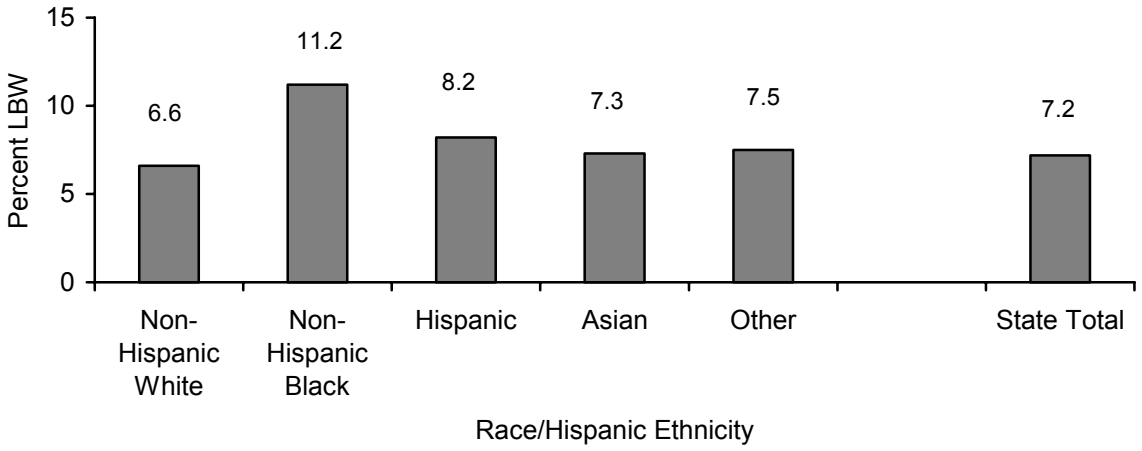
Figure 14: Trend in percentage of Massachusetts babies with low birthweight (LBW), 1990-2001



Source: Massachusetts Births, 2001.

- The proportion of Massachusetts babies with LBW has increased from 5.8% in 1990 to 7.2% in 2001, which represents a 24.1% increase. The increase in LBW may be due to the increase in the number of babies born to older women and to those with multiple births. Twins and other higher order multiples tend to be born earlier and smaller than singletons. The largest increase in multiple births in the last decade has occurred in older women.
- In each of the years shown, the proportion of babies with LBW did not meet the 5.0% or less target.

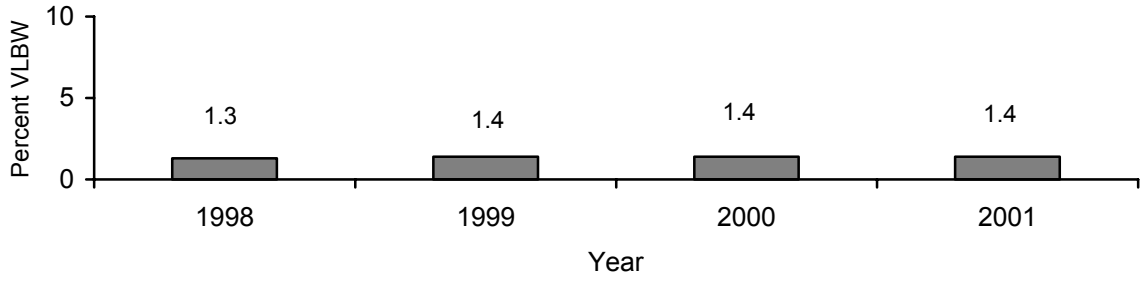
Figure 15: Percentage of Massachusetts babies with LBW by race/Hispanic ethnicity



Source: Massachusetts Births, 2001.

- In 2001, the proportion of Massachusetts live births with birthweight less than 2500 grams varied by race/ Hispanic ethnicity. It was highest (11.2%) among Non-Hispanic Blacks, followed by 8.2% among Hispanics, 7.3% among Asians, and 6.6% among Non-Hispanic Whites.

Figure 16: Percentage of Massachusetts babies with very low birthweight (VLBW), 1998-2001

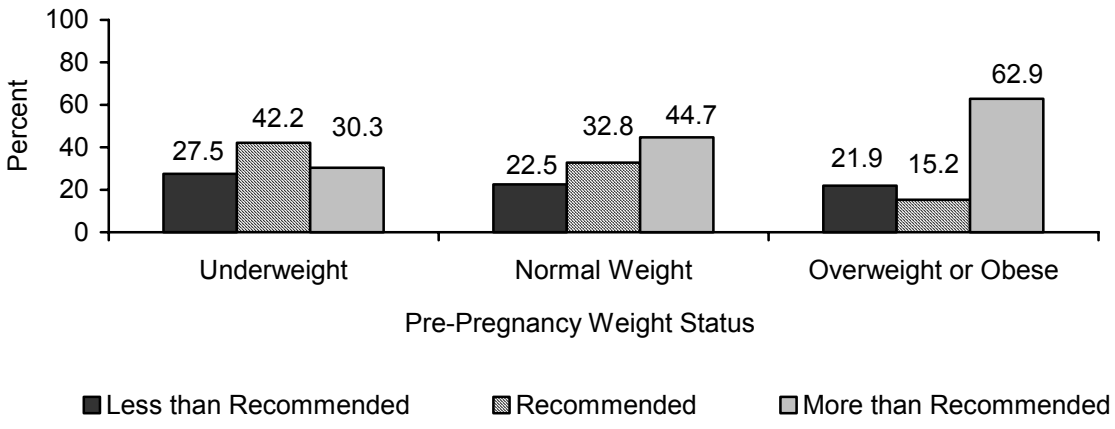


Source: Massachusetts Births, 2001.

- The proportion of Massachusetts babies with very low birthweight (VLBW; birthweight < 1500g) varied only slightly between each of the four years shown.
- In each of the four years the proportion of babies with VLBW in Massachusetts did not meet the 0.9% or less target.

HP 2010 Objective 16-12	(Developmental) Increase the proportion of mothers who achieve a recommended weight gain during their pregnancies.
Definition	Not specified (see below for alternative definition used here).
State Data Source	Not specified
Target	Not specified

Figure 17: Weight gain status during pregnancy by pre-pregnancy weight status



Source: Massachusetts PNSS, 1999 (n = 22,876).

No state-level data source has been identified by DHHS; data shown are from Massachusetts PNSS. DHHS (2000a) has not specified an operating definition of weight gain during pregnancy. The recommended weight gain ranges shown below are based on the recommendations of the Institute of Medicine (IOM, 1990; Suitor, 1997).

Recommended Prenatal Weight Gain by Pre-Pregnancy Weight Status (IOM, 1990)

Pre-pregnancy Weight Status	Recommended Prenatal Weight Gain
Underweight	28 - 40 pounds
Normal weight	25 - 35 pounds
Overweight	15 - 25 pounds
Obese	No more than 15 pounds

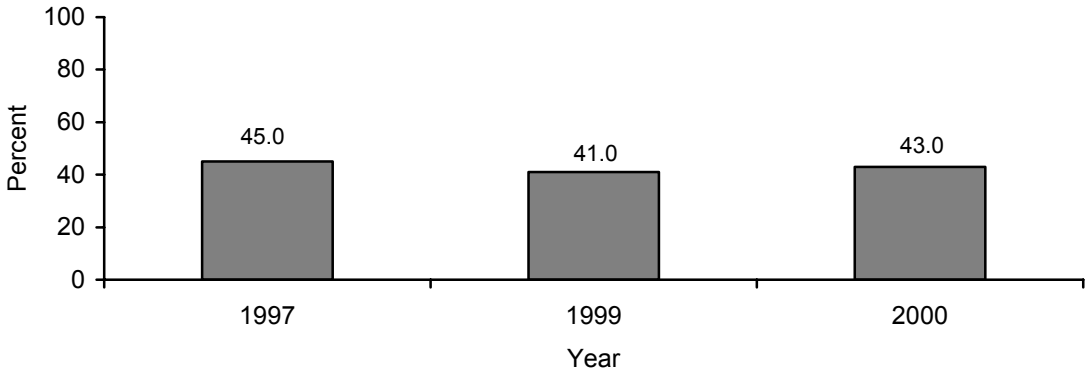
- Among low- to moderate-income women enrolled in the WIC Program, approximately two-thirds of those who were either overweight or obese before pregnancy gained more than the recommended weight during their pregnancy (60.5% and 66.1%, respectively), compared to 30.3% of women who were underweight and 44.7% of women who were of normal weight prior to pregnancy.

- These data may not be generalizable to those women who did not have similar socioeconomic backgrounds, and who did not participate in public nutrition programs.

6. Developmental Disabilities and Neural Tube Defects

HP 2010 Objective 16-16	Increase the proportion of pregnancies begun with an optimum folic acid level.
16-16a	Consumption of at least 400 µg of folic acid each day from fortified foods or dietary supplements by nonpregnant women aged 15 to 44 years.
Definition	Number of nonpregnant females aged 15 to 44 years who reported consuming an average of 400 µg of folic acid daily over the past month.
State Data Source	BRFSS[1]
Target	80% or more

Figure 18: Proportion of women aged 18 to 44 reporting consuming an average of 400 µg of folic acid daily over the past month, 1997-2000



Source: Massachusetts BRFSS, 1997, 1999, 2000. Please note that the unit of scale on the x-axis is not continuous.

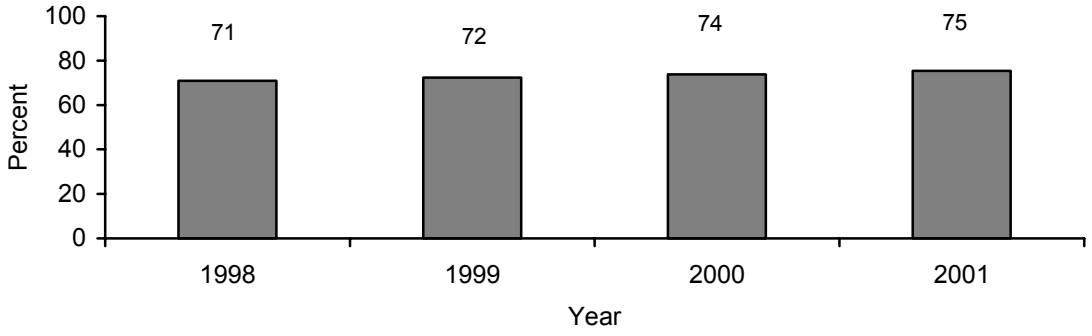
- The proportion of Massachusetts women aged 18 to 45 years who reported consuming an average of 400 µg of folic acid daily was 43% in 2000, compared with 45% and 41% in 1997 and 1999, respectively.
- Only slightly more than half of the target number has been met for each of the three years.

[1] Massachusetts BRFSS only includes women aged 18 to 44; no data are available for women aged 15 to 17 years, years that are specified within the age range of the objective.

8. Breastfeeding, Newborn Screening, and Service Systems

HP 2010 Objective 16-19	Increase the proportion of mothers who breastfeed their babies.
16-19a	In early postpartum period.
Definition	Number of mothers who indicate that breast milk is at least one of the types of milk their infant was fed in the hospital.
State Data Source	Not identified
Target	75% or more

Figure 19: Percentage of Massachusetts mothers breastfeeding or intending to breastfeed their infants at the time the birth certificate was completed, 1998-2001



Source: Massachusetts Births, 2001.

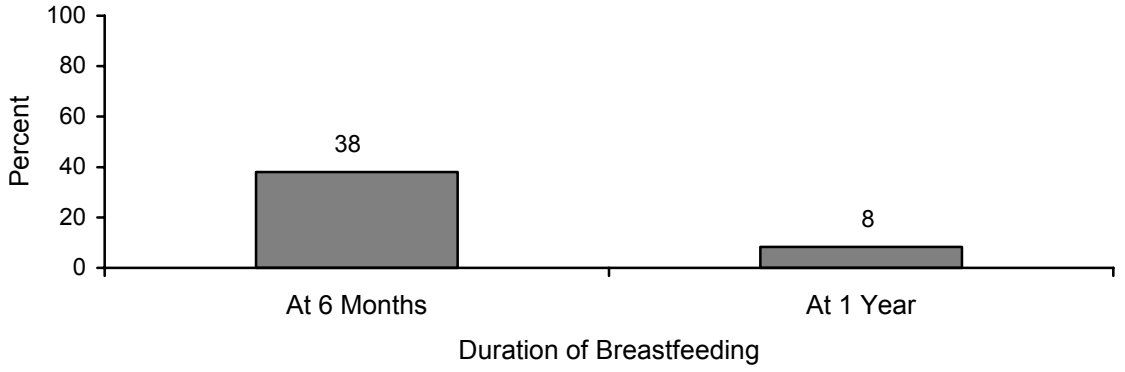
- There has been a 5.3% increase in the initiation of breastfeeding from 1998 to 2001. Three-quarters (75%) of Massachusetts mothers reported that they breastfed or intended to breastfeed their infants at the time the birth certificate was completed in 2001, compared with 71%, 72% and 74% in 1998, 1999, and 2000, respectively.

- From 1998 through 2000 the proportion of Massachusetts mothers who breastfed or intended to breastfeed their infants in the early postpartum period approached the 75% target, and surpassed the HP2010 target in 2001.

- DHHS has not identified a state data source or defined “early postpartum period.” It should be noted that the breastfeeding data shown were obtained from the birth certificate. These data are collected most commonly in the first or second day after birth.

HP 2010 Objective 16-19	Increase the proportion of mothers who breastfeed their babies.
16-19b	At six months.
Definition	Number of mothers who indicate that breast milk is at least one the types of milk their infant was fed 6 months after delivery.
State Data Source	Not identified
Target	50% or more
16-19c	At 1 year.
Definition	Number of mothers who indicate that breast milk is at least one of the types of milk their infant was fed 1 year after delivery.
State Data Source	Not identified
Target	25% or more

Figure 20: Percentage of low- to moderate-income Massachusetts women breastfeeding their babies for at least 6 or 12 months



Source: Massachusetts PedNSS, 2001.

Although DHHS has not identified a state data source, data presented are from Massachusetts PedNSS. Duration of breastfeeding (in terms of breastfeeding for at least 6 months or for at least 12 months) reflects how long a child was breastfed either exclusively or with supplementation with formula. It is likely that estimates of breastfeeding duration are underestimated due to a limitation of the data collection process.

- Over one third (38%) of low- to moderate-income Massachusetts mothers enrolled in the WIC Program reported breastfeeding their infants for at least 6 months. However, at one year, only 8% of mothers reported still breastfeeding.
- At both 6 months and one year, the proportion of Massachusetts mothers who breastfed their babies was below the target of 50% and 25%, respectively.
- Data are not representative of all Massachusetts women, only those who participate in the Massachusetts WIC Program. No data on breastfeeding duration are available for the general population.

Appendix 1: 2004 Massachusetts Nutrition Board

Chairperson

Catherine D'Amato
President and Chief Executive Officer
The Greater Boston Food Bank, Inc.

Members

Johanna T. Dwyer, D.Sc., R.D.
Director, Frances Stern Nutrition Center
New England Medical Center

Elizabeth Chace-Marino, Director
Government & Corporate Affairs
The Stop & Shop Supermarket Company

Nancie H. Herbold, Ed.D., R.D.
Chair and Professor of Nutrition
Simmons College

Rena Prendergast, M.T.S., R.D., L.D.N.
Dietetic Director, University of Massachusetts

Representatives from State Agencies

Shirley Chao, R.D.
Director, Nutrition Services, Elderly Nutrition Programs
Executive Office of Elder Affairs

Mary Kelligrew Kassler, MBA
Director, Nutrition Division
Massachusetts Department of Public Health

David Webber, M.P.H.
Coordinator, Farmers' Market Coupon Program
Department of Food and Agriculture

Ed Sanders-Bey
Assistant Commissioner
Policy and Program Management
Massachusetts Department of Transitional Assistance

Katie Millett
Administrator, Nutrition Programs and Services
Massachusetts Department of Education

Jan Kallio, M.S., R.D., L.D.N.
Director, Nutrition Services, Nutrition Division
Massachusetts Department of Public Health

Liaison Members

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U.S. Department of Agriculture, Northeast Regional Office

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University of Massachusetts, Amherst

Leslie Oliver, R.D., L.D.N.
Nutrition Manager
Greater Boston Food Bank

Kirsten Johnson, M.P.H.
Nutritionist
University of Massachusetts Extension, Boston

Appendix 2: Massachusetts Food and Nutrition Programs

Program	Telephone
Child and Adult Care Food program	781-338-6494
Farmers' Market Nutrition program	617-626-1700
Food Banks:	
Eastern MA: Greater Boston Food Bank	617-427-5200
Central MA: Worcester County Food Bank	508-842-3663
Western MA: The Food Bank of Western MA	413-247-9738
Food Source Hotline (Project Bread)	1-800-645-8333
Food Stamp Program (Transitional Assistance Office)	1-800-249-2007
National School Lunch Program	781-338-6498
Nutrition Program for the Elderly	1-800-882-2003
School Breakfast Program	781-338-6498
Summer Food Service Program	781-338-6494
WIC Nutrition Program	1-800-942-1007

Source: Massachusetts Department of Public Health, Bureau of Family and Community Health.

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